BLODGET

ON THE CLIMATIC CONDITIONS OF
THE SUMMER OF 1853


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CLIMATIC CONDITIONS

OF THE

SUMMER OF 1853,

Most directly affecting its Sanatary Character,

(A Report to the Secretary of the Smithsonian Institution, Washington.)

BY LORIN BLODGET, Esq.

IN CHARGE OF THE METEOROLOGICAL DEPARTMENT.

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THE CLIMATIC CONDITIONS

OF THE

SUMMER OF 1853.

THE most important condition of our summer climate affecting its sanatary character is the most difficult to measure. Humidity, or the proportion of the amount of moisture required to fully saturate the air, which it is found to contain at any time, is, probably, the controlling sanatary condition at all high temperatures. This is of course exclusive of local or miasmatic causes, which are climatic only in the more limited sense, and secondary to temperature and humidity under all circumstances.

The determination of humidity in such a manner as to make the results comparable at different places, and available for general grouping, is the most recent point gained in meteorological observation. Without concert of action, and uniformity in the manner of observation, and in the instruments used, the earlier observations served only for compari-

NOTE.—The unusual conditions of temperature and humidity of the present summer have attracted much attention, and a brief reference to them and comparison of extremes was thought to be due to the interest felt in general meteorological research. In attempting this comparison the amount of matter somewhat outgrew the compass of a mere article, and it has been extended, with a more general purpose and character, as a report upon those conditions. The informality or incompleteness of some of its parts renders this designation too comprehensive, but, as prepared with the promptness necessary to connect the whole with the fresh interest of the public in the subject, it could hardly be otherwise. It is given, therefore, not as a complete report, but only as the best exhibit of the subject that may be made while its full interest remains.

L. B.

sons at the same station, and even that imperfectly. The various forms of hygrometer and dew-point instruments have been generally superseded by the wet-bulb thermometer. The observation of the *temperature of evaporation*, as given by this instrument, under circumstances which truly represent the mass of surface atmosphere at the time, or what may be termed normal conditions in respect to the *evaporating effect*, has entire uniformity of character, and such observations may be relied upon for the fullest comparison and illustration.

The summer of 1853 has been extraordinary in its climatic conditions, and the extremes of temperature and humidity were much more striking and clearly defined than usual. The relation which these conditions may have to the general sanatary character of a month or season, may therefore be analyzed under unusually favorable circumstances, if our observations are sufficient to define them with precision. The purpose of this paper is to present them in the proper grouping and contrasts, and this process will serve as a general test of their accuracy, and apply them to their most important purpose at the same time.

Some of the more disastrous periods of mortality of the summer have been attributed directly to extreme temperature, while the attendant condition of humidity has scarcely been recognized as influencing results. Violent epidemics, and even contagious diseases, may have been initiated by some maximum of these conditions, and the subsequent propagation and continuation may be due to other causes more difficult to decide upon. Without assuming entire dependence upon the conditions of climate we now measure for epidemics of the more violent character, it is still a point gained of unusual importance when numerical values may be given to humidity as well as temperature. With these the statistics of disease and mortality may ultimately undergo thorough comparison and examination, and to that research the greatest and final results will belong.

The climatic research conducted by the Smithsonian Institution now embraces every climatic district of the country.

The full registers, including with the more common observations the difficult one of the temperature of evaporation, from which is deduced the relative humidity, number about thirty, which are immediately returned at the close of an observed month. There are others in the New-York and Military Systems, accessible at a later period; but the first suffice to determine every important district in this respect. Correct temperature observations for the open air are reported in the same prompt manner from about two hundred stations, of which about eighty measure carefully the amount of precipitation.

From these data the present exhibit is prepared. It will present, first, the several periods of excessive heat in the three summer months of the present year, and the comparison of various districts during those periods.

Second, the periods of excessive humidity, and of unusual amount of precipitation; and the relation of these in time and place to the division of excessive variations of temperature.

It also marks extremes of absence of humidity, and of cold, which are less important as sanatary conditions standing alone, though the low humidity apparently occurs generally as a very important modification of the injurious character of a period of excessive heat.

The first general high temperature of the season occurred on the 3d to the 5th of June, extending from Montreal to Florida, but this did not occur at the West generally. At the South it was a day later than in New-York, and its maximum at the North, from Montreal to New-York, 83°, and from Chapel Hill, N. C., to Savannah, Ga., 92°. The period was so short that no general consequence would probably attach to it, however, and the amount of humidity was not unusual.

From the 14th to the 18th, the heat was excessive and general. At the extreme West, in Minnesota, Iowa and Wisconsin, it occurred on the 12th and 13th; the atmosphere affected passing eastward across the continent as a well-defined body, according to what seems a law of all dynamic or inconstant climatic phenomena. It did not extend beyond Camden, S. C.,

southward, and attained a higher point at the West than elsewhere, of 90° to 94° in Ohio, Kentucky, and westward in the same latitudes. Succeeding this, a general excess of temperature occurred from the 20th to the 23d, less than the preceding in the extreme North, and with a considerable fall there on the 22d, but quite unusual and long-continued at almost every other part of the country. The maxima varied from the 20th to 23d, and ranged from 90° to 97°. With the slight allowance for excess, which usually should be made in the readings at these extreme points, the maximum of 95° was probably general, from New-York to Savannah, on the 23d, and the same degree the day previous in Ohio and Michigan. In Tennessee and southwestward, the same point was reached on the 20th; in Mississippi and Texas still one day earlier.

Lastly, a most extraordinary extreme of heat occurred on the 29th and 30th; in this case, as before, beginning earliest at the West by a day and a half for the distance from St. Louis to Washington. This extreme was central in the latitude of Washington, and was limited at Savannah on the South, and Burlington, Vt., on the North. It attained 96° to 98° in Tennessee, Kentucky, and Southern Ohio, and 99.5° to 102° at Washington and in Eastern Virginia and N. Carolina. This is without any known parallel in the records of temperature here, and is several degrees above any recorded temperatures at New-Orleans, Mobile, or Savannah.

The general temperature of July was also high, and slightly above the normal mean in most parts of the United States. The mean of June was much above the normal one, attaining a maximum of excess in Wisconsin and Illinois of nine degrees. It was there 4.5° above the mean for July,—this excess being less at the East, where the two months were nearly equal, and June 5° above the normal mean.

The excessive heat of the last days of June was prolonged through the 1st and 2d of July at 94° in Virginia and at the South, and the range was generally high at Philadelphia and South until the 10th, when it was again at 92 to 84°. North of latitude 40° there were no great heats in this month, and the temperature was quite uniform throughout. The tempe-

rature was at or above 90°, after the middle of the month, only in Central Georgia and Alabama, and westward in this latitude to Texas, for two or three days about the 20th, and again at the close of the month.

In August, a period of general excessive heat occurred, beginning, as usual, earlier at the West, and reaching 90° at Lac-qui-parle, on the St. Peter's River, Minnesota, (lat. 45°, long. 96°,) on the 7th and 8th. The maximum in Illinois and the adjacent States was 90° to 94° from the 8th to the 13th, in Ohio and Kentucky nearly the same; and, passing eastward a little later through Pennsylvania, the district of greatest excess was central at New-York from the 12th to the 14th.

The temperature was below 80° at Cedar Keys, Talahassee, and Pensacola, Fla., through these days, and at no place South reached 90°. Later in the month, from the 25th to the 31st, the heat was unusually great in the Southwest,—Texas, the Cherokee Territory, and Mississippi,—with an extraordinary reverse in Iowa and the adjoining States. Frosts occurred in all the States West and North of Ohio at some day from the 25th to 28th inclusive; and in some parts of Iowa, Wisconsin, and Michigan, there were two or three in succession, and great injury was done to vegetation. At Lac-qui-parle, Minnesota, 3° farther north, and nearly a thousand feet higher, there was one very slight frost on the 27th.

These extraordinary conditions of temperature become more important when connected with the accompanying conditions of humidity. As general comparisons of this last condition have hardly been possible heretofore, the present summer cannot be compared with previous years, except in one or two extremes of its sanatary effect.

The observations of humidity are, however, believed to be of the very best character. The temperature of the *natural evaporation* has been taken under uniform directions, and with uniform instruments. The actual *evaporating effect* of the air at the time, as the measure of its true evaporating power in a climatic sense, and such as could affect animal life and the growth of vegetation, has been sought in the directions given, and in the practice of the observers.

From such observations the fraction of saturation, or the percentage of humidity existing in the air at the time, has been deduced by Regnault's formulas, first determined theoretically from the latent and specific heat of air and aqueous vapor, and subsequently modified in the numerical elements to conform to the results derived from actual experiment.

These results are arranged in a tabular form for greater convenience of comparison. The "relative humidity" is the percentage of moisture which the air at the time contains. 100 being full saturation. The absorbent power of the air in highly heated periods is directly as this decrease of the degree of saturation, and is the most precise measure possible of the sanatary condition which is peculiarly climatic, and not dependent on miasmatic or other secondary causes.

A brief reference to the prominent points in this comparison may assist the examination. It may be stated that the fractions of saturation are much more variable in cold than in warm climates at all temperatures. The mean summer saturation at New-Orleans, by the valuable observations of Dr. Barton,* is .857, and the mean saturation for the year .811. The degree there is quite constant through successive years for the different seasons, and has its maximum in summer. The maximum in the northern portion of the United States is also in summer, but the mean is something more than one-tenth of saturation less than that at New-Orleans.

The fractions given in the tabular statements used for the present general comparisons are from one observation only for the day, that at 2 P. M.; which is very near the hour for maximum temperature also. It would be equally important to give the mean of the day, but as the labor would be very much increased, the single hour of extreme range of the several conditions, giving the most striking contrasts, has been thought sufficient for the present purpose.

The heats of June are seen at once to have been remarka-

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* *Report to the La. State Med. Soc., on the Meteorology, Vital Statistics, and Hygiene of Louisiana.* By Dr. E. H. Barton, 1851. The amounts here given are a summary from observations at sunrise, midday and 9 P. M., for eight years.

bly dry. The fraction of saturation was at a mean of about 50 in the Northeast, and but 40 to 45 in the interior and in Texas, during the hot days from the 14th to the 17th, though much higher at Pensacola and the extreme South, where the heat was not so great. At the 20th to the 23d, the rate was about the same in the districts of excessive heat. On the 29th and 30th, the percentage was but 35 to 40 in the narrow district through Tennessee, Kentucky, and Virginia, which marked 100° as the maximum temperature. The coincidence of unusual absence of humidity with this unequaled temperature was fortunate. The usual saturation with this degree of heat would have been extremely destructive to health and life.

The first two days of July were a continuation of the conditions of the last of June. The remainder of the month was not unusual in its hygrometric character generally, though at New-Orleans, where, unfortunately, we have no observations after May, the evidences of high saturation are given in the profuse and constant rains of the middle of the day, preceded by a hot and oppressive morning. This weather was reported as quite uniform for the first and most fearfully fatal month of the yellow fever. The approach to a tropical character in the midsummer saturation and daily rains, at New-Orleans, is more or less distinctly marked in different years at all times, but the present summer seems to have attained a maximum in this respect, and to have given in this way terrible effect to the epidemic, when once induced, in whatever manner that may have been. It is hoped that careful observations of the humidity of the yellow-fever period of the present summer there, have been made. The Gulf Coast in Texas and Florida does not properly represent the humidity or other climatic peculiarities of New-Orleans, nor does any place in the interior from which we have observations.

The great heat of August was most remarkable in its hygrometric condition also, and universally attended with a high fraction of saturation. At Washington it was 55 to 60, and at New-York near 70 per cent at 2 P. M., and almost at

saturation morning and evening. Though the temperature of the air was but 90° to 94°, or 6° less than that of the last of June in Washington and Richmond, where no fatal effects were felt, the mortality from the effect of great heat with great saturation was frightful. By reference to the tabular statements it may be seen that the absolute degree of heat could not have caused the fatality alone, or without the attendant humidity. Some term more specific or more comprehensive than *sun-stroke* seems therefore required to designate the fatal congestion, or whatever may be the immediate cause of death, in these cases.

Another and perhaps clearer point for comparison is the *temperature of evaporation*, or that of the wet-bulb thermometer alone. The dew-point has usually been obtained for such comparisons, but it is far less easy to obtain without error; and, as it is itself no absolute determination, but an intermediate point only, it is quite generally discontinued.

The temperature of evaporation at New-York, at the time of greatest mortality in August, was from 80° to 84°, being higher than the maximum temperature of evaporation at New-Orleans at any time in 1852 by two degrees. At the latter place it reached 82° but once in that year. At Austin, Texas, for the last August, the same maximum was 78°; at Savannah, Ga., 79°; at Camden, S. C., Culloden, Ga., and Washington, 77°. Jacksonville, Fla., and Eutaw, in Central Alabama, were the only places at the South giving a temperature of evaporation of 84°, or as high as that at New-York on the 13th and 14th of August.

With such conditions of temperature and saturation, in a normally elastic and cool climate, it is not wonderful that the mortality from its immediate effect should have been very great. It is more remarkable that some incipient epidemic was not started in full vigor to rage after the principal inducing cause had passed away. With the exceptions of New-Orleans, and New-York at this limited period, the heats of the summer, though extreme, have been attended with a low humidity, and have been unusually favorable in this respect. The maximum heat of June, which was from 4° to 9° above

the mean, could scarcely have passed without most injurious effects at the ordinary percentage of humidity. The excessive heats of lower Texas, the Rio Grande Valley, and other districts, where the thermometer rises to 112 and 115°, have a temperature of evaporation not above that at New-Orleans, with the air at 87°. At Austin, Texas, with the air at 98° several times in June, the temperature of evaporation never rose above 78°, and at the highest air temperatures was at 74° and 76°,—or nearly 10° below the temperature of evaporation at New-York, when the air thermometer did not exceed 95°.

The heats of those districts are therefore endurable and even pleasant, at a degree which would seem fatal to life, from the great evaporating power and elasticity of the atmosphere which uniformly prevails.

As an attendant condition resulting from humidity, the amount of rain for the three summer months should be given in this connection.

The normal distribution of rain among all the months is very nearly equal in the northeastern parts of the United States. The amount varies through a wide range, however, in different years. Each of the summer months may change from an entire absence of rain to an ordinary maximum of twelve inches; and, in one or two instances, an extreme of twenty to twenty-two inches. It is difficult, therefore, to say as definitely what the relation of either month has been to the normal condition from this observation, as from either temperature or the hygrometric observation.

In June, the amount of rain was much less than usual, generally. In Maine and most of New-England, the amount was least, varying from half an inch to an inch and a half in depth. The amount for all central parts of the United States was within these limits, except the eastern portion of Virginia. In Florida, there was about the usual amount (of 3 to 3½ inches). In a small district central in Iowa it reached 6½ inches.

In July, the amount was particularly large at Philadelphia and southward to Florida, where it was 11.5 inches. In

Alabama and at New-Orleans, the amount was nearly as great, and in Iowa and Wisconsin it was again large,—from 6 to 8 inches. In other parts of the United States and Canada, the usual amount of from 2.5 to 4 inches fell. There were, however, large districts in which the least of these amounts, in conjunction with the very little rain in June, caused very severe droughts. The principal of these was in Eastern Ohio, and Western Pennsylvania, and New-York. In Central New-York the amount was variable and the drought in some places severe.

In August, the rains were excessive in a district extending from the lower part of New-Hampshire to Northern New-Jersey; at Bloomfield, N. J., and New-York, the amount falling was near 12 inches. From Baltimore to Savannah, also, the amount was large, being from 5 to 6.5 inches, and about 1½ inches more than usual. The last days of July and the first days of August gave an excessive precipitation in Eastern Pennsylvania and New-York, New-Jersey, &c. These flooding rains, which gave in some instances 4 to 8* inches in depth of water in a single storm of a few hours, attended very warm weather, and immediately preceded the fatal heats of 12th to 14th August.

They were also followed by profuse rains, and the whole period from 25th July to 15th of August seemed a substitution of a tropical climate for the usually elastic one, in the district referred to.

The tabular statistics given with this paper are intended to embrace the more marked extremes at the best observed stations of temperature of the air and of evaporation, with the humidity as determined from these. For June, thirty-two stations are given with these observations. For July, the general reference to extremes, and the table of mean temperatures and amount of rain, appear sufficient. The conditions were general, and the extremes not signally marked in most parts of the United States. At New-Orleans there were evidently unusual features, but the districts adjacent to it do not sufficiently represent them to warrant any tabular arrangement

* Register of R. L. Cooke, Principal of Bloomfield Academy, New-Jersey.

of extracts. It is to be regretted that we have not observations there, though they may have been made for part of the month, and may ultimately be compared with other districts.

For August, extracts are given from the registers at twenty-four stations, sufficient to represent every important district.

Mean temperatures and amount of rain are given in a tabular form from over ninety stations.

The temperatures were observed at 7 A. M., 2 P. M., and 9 P. M., in nearly every case; the exceptions are two or three instances, in which the hours were 6 A. M., 2 P. M., and 10 P. M., and as many at sunrise, 9, 3, 9; but in these instances the mean does not differ essentially from the first. Some slight discrepancies appear in this statement, though the general correspondence of stations which should agree is quite apparent. In reference to these means the comparison of June and July with each other and with the normal mean has already been made. The mutual comparison of the three months shows an extraordinary uniformity in absolute position. This seems, at first, to give July a considerable fall below the normal mean, but the truth is rather that it is itself slightly above, and June and August very much above the mean of other years. The normal curve at New-York and northward is a rise of 4° to 4.5° from the mean for June to that for July, and a fall of 3° to that of August. At Philadelphia and southward it is somewhat less, decreasing to the Gulf Coast, where the curvature nearly disappears. Fifty-seven consecutive years of observation near Philadelphia give 4.3° as the first value, or the change from June to July, and 2.9° as the second, or fall to the mean of August. With this general guide the comparison of the various stations in this respect may readily be made by the reader.

The amount of rain may be compared with normal amounts in this general way also, in addition to the references already made to the extremes. In the New-England States the observed mean precipitation for the last twenty years is greatest in August, and least in July, of the three summer months.—Three and one-fourth, two and one-fourth, and three and three-fourths inches, consecutively represent the summer fall of rain there for the three months.

In New-York this difference disappears. There and southward to Baltimore the mean of long series of observations gives about 3.5 inches as the mean for each summer month.

At the South the amount is greater, with a tendency to excess in August in the Atlantic States, but elsewhere the summer months are nearly uniform in quantity, and the amount greater than in other parts of the year. Six to seven inches of rain in the interior at the South, or away from the mountains or the immediate coast, is nearly the general mean for each summer month.

At Cincinnati the months again become nearly equal in amount of rain, through the year, and the summer quantity, monthly, 4.4 inches. In Iowa it is more, though very irregular; and elsewhere at the Northwest falls off rapidly, preserving a relation for each month of about one-tenth to the annual amount. This hasty reference to mean quantities cannot be made very clear here, with the space assigned and the present purpose, but the few points given may assist in judging of profusion or failure of rain for the summer in the general way required for sanitary comparison.

In conclusion, it may be said that a more precise definition of periods of time, and a closer limitation of districts, in respect to each branch of the subject, is very desirable, and is possible, also, from the data already at hand, with greater space, and time for a more full elaboration and comparison. Limited districts, of extreme drought in these months, and others of the spring, have occurred. Some of these, in time and place, would be quite important to define in the special purpose we now have, and still more in their connection with the agricultural prosperity of the country for the year.

That our climate has general characteristics, in both the conditions treated here, which permit a clear grouping and statement almost at the time the events are passing, is considered fully sustained by these references and statistics. This is itself of great interest, as showing that we have the means at hand to make the research almost coincident in time with the phenomena. The great advantage of this in all that pertains to the sanitary condition will be recognized at once.

JUNE, 1853.

BURLINGTON, VT.—Prof. Z. Thompson.

	Air.	Evap'n.	Humidity.
14th	91.	76.	.47
15th	92.	75.	.39
16th	82.	74.	.67
17th	85.	74.	.58
20th	91.	78.	.53
21st	82.	65.	.85
22d	79.	67.	.50
23d	92.	76.	.46
30th	89.	75.	.50

PITTSFIELD, MASS.—Theo. H. Benjamin.

14th	83.3	69.8	.49
15th	85.	71 6	.59
16th	85.	75.	.62
17th	75	70.	.78
29th	74 3	68.9	.74
30th	80 9	73.	.67

WORCESTER, MASS.—Dr. E. A. Smith.

14th	82.4	66.2	.39
15th	86.	66 2	.30
16th	87.	69 8	.29
17th	80 6	68.	.49
20th	86.9	71.6	.45
21st	90.	71.6	.37
29th	73.4	68	.74
30th	84.5	71.6	.51

St. MARTIN'S, MONT'L.—Dr. C. Smallwood

14th	91.3	78 6	.53
15th	94 3	79.6	50
16th	97.	79 9	.56
17th	83.	72.8	.61
20th	86.7	77.	.65
21st	72	61.	.50
22d	61.	54.8	.66
23d	90 6	80.	.62
30th	82.	70.	.55

AMHERST, MASS.—Prof. E. S. Snell.

14th	86.	70 7	.43
15th	88.	77.	.58
16th	89 5	77.7	.58
17th	79.	74.	.77
20th	89.	76 3	.52
21st	91 3	76 8	.49
22d	85	79.	.79
23d	81 5	75 9	.74
29th	73 6	70 7	.86
30th	86.5	78.4	.68

NEWBURYPORT, MASS.—Dr. H. C. Perkins

14th	72 5	68 7	.71
15th	83 3	63.5	.55
16th	95	68 9	.49
17th	85.	68 9	.57
20th	87.6	76.1	.56
21st	80.7	69 4	.54
29th	69.6	63 5	.59
30th	78.8	63.5	.71

POMFRET, CT.—Daniel Hunt.

13th	70.	65.	.75
14th	82.	74.	.67
15th	78.	74.	.82

POMFRET, CT. (Continued.

	Air.	Evap'n.	Humidity.
16th	82.	76.	.75
17th	77.	73.	.82
20th	86.	77.	.65
21st	89.	80.	.66
22d	86.	81.	.79
29th	72.	69.	.86
30th	84.	78.	.75

MADRID, N. Y.—E. A. Dayton.

13th	—	—	—
14th	87.4	73.4	.55
15th	91 4	73.	.47
16th	91.2	76.6	.55
17th	79 5	68.	.58
20th	84.3	—	—
21st	72 3	59.	.49
22d	74 8	65.1	.62
29th	79 7	73.4	.45
30th	83.1	65.5	.45

BLOOMFIELD, N. J.—R. L. Cooke.

13th	82 5	71.	.54
14th	86 5	74.	.54
15th	84.	72.	.54
16th	84.	75.	.63
17th	57.5	77.	.60
20th	96	82.	.53
21st	99 5	83.	.48
22d	95.	81.	.51
29th	76.	71.5	.80
30th	89.	84.	.80

PHILADELPHIA.—Prof. J. A. Kirkpatrick.

13th	79.	68.	.55
14th	87.	76.	.59
15th	87.	74.	.52
16th	87.	73.	.49
17th	85.	75.	—
20th	96.	79.	.45
21st	95.	80.	.50
22d	95.	79.	46
29th	85.	76.	.64
30th	95.	80.	.50

LIMA, PA.—Joseph Edwards.

13th	75.7	67.4	.63
14th	84 5	75.2	.63
15th	84.7	71.8	.51
16th	81 8	70.8	.56
17th	71 2	69	.89
20th	87.8	73.7	.49
21st	90 8	77.9	.53
22d	90.3	78.	.56
29th	82 4	77.	.77
30th	90 7	77 9	.54

NORRISTOWN, PA.—Rev. J. G. Ralston.

13th	81.	70.	.56
14th	89.	78.	.59
15th	87.	72.	.45
16th	87.	72.	.45
17th	72.	72.	1.00
20th	90.	76.	.50
21st	93.	81.	.58
22d	93.	77.	.46
29th	87.	78.	.65
30th	90.	77.	.56

HOLLIDAYSBURG, PA.—J. R. Lowrie.

	Air.	Evap'n.	Humidity.
13th	85.8	66.9	.32
14th	89.9	71.2	.36
15th	86.3	72.7	.50
16th	88.7	71.2	.39
17th	79.3	68.	.53
20th	92.4	72.3	.34
21st	86.3	76.1	.61
22d	86.7	76.9	.59
29th	34.7	75.7	.39
30th	34.6	74.8	.38

BALTIMORE, MD.—Dr. L. H. Steiner.

13th	82.	70.1	.53
14th	87.4	75.2	.54
15th	86.9	73.	.49
16th	87.	70.1	.40
17th	77.5	70.1	.68
20th	95.5	75.3	.36
21st	95.7	75.5	.36
22d	96.2	78.8	.44
29th	88.1	78.9	.35
30th	92.3	73.5	.38

ALEXANDRIA, VA.—Benj. Hallowell.

13th	78.8	69.8	.62
14th	90.5	76.1	.49
15th	86.	75.2	.59
16th	86.9	73.4	.51
17th	71.6	69.8	.91
20th	90.5	77.	.52
21st	90.5	77.	.52
22d	89.6	78.8	.60
29th	91.4	74.3	.42
30th	95.	75.2	.37

SAVANNAH, GA.—Dr. John F. Posey.

13th	84.	73.9	.60
14th	86.	68.7	.40
15th	85.8	72.6	.51
16th	83.8	74.1	.61
17th	84.	73.5	.59
20th	81.3	76.1	.77
21st	87.8	78.6	.64
22d	92.3	77.9	.50
29th	90.8	75.2	.48
30th	91.2	78.4	.54

CAMDEN, S. C.—Dr. Thornton Carpenter.

13th	85.9	70.	.35
14th	92.	72.2	.35
15th	93.	73.7	.37
16th	91.	73.	.39
17th	89.	75.	.50
20th	78.5	73.8	.79
21st	89.5	78.	.58
22d	93.	75.	.40
29th	97.5	73.6	.27
30th	97.6	74.	.29

SPARTA, GA.—Dr. E. M. Pendleton.

13th	93.	73.	.35
14th	94.	70.	.26
15th	96.	70.	—
16th	95.	71.	.26
17th	95.	73.	.31
20th	90.	78.	.56
21st	92.	72.	.54
22d	—	—	—
29th	96.	70.	—
30th	97.	72.	26.

CULLODEN, GA.—Prof. John Darby.

	Air.	Evap'n.	Humidity.
13th	85.1	68.7	.40
14th	85.6	67.1	.33
15th	88.7	69.8	.35
16th	86.7	67.1	30
17th	88.5	70.8	.38
20th	79.5	72.3	69
21st	88.5	75.2	.50
22d	87.8	75.9	.55
29th	93.2	73.	.34
30th	92.5	72.3	.34

EUTAW, ALA.—A. Winchell.

13th	95.	78.	.44
14th	92.	75.	.42
15th	96.	78.	.42
16th	96.	79.	.45
17th	98.	79.	.40
20th	99.	82.	.47
21st	93.	82.	.61
22d	98.	83.	.51
29th	104.	82.	.36
30th	101.	86.	.52

JACKSONVILLE, FLA.—Dr. A. S. Baldwin.

13th	82.	76.	.74
14th	81.	74.	.71
15th	81.	75.	.74
16th	80.	75.	.78
17th	83.	77.	.75
20th	85.	80.	.82
21st	88.	83.	.80
22d	84.	—	—
29th	87.	79.	.69
30th	84.	79.	.79

PENSACOLA, FLA.—Com. Tatnall.

13th	81.	78.	.87
14th	81.	77.	.83
15th	82.	76.	.74
16th	82.	79.	.87
17th	82.	78.	.83
20th	83.	78.	.79
21st	77.	76.	.95
22d	84.	78.	.75
29th	86.	83.	.88
30th	85.	79.	.76

AUSTIN, TEXAS.—Dr. Sam'l K. Jennings.

10th	96.	72.	.27
11th	98.	74.	.28
12th	83.	73.	.60
13th	84.	72.	.54
14th	90.	76.	.50
15th	86	68.	.36
16th	70.	66.	.80
17th	90.	76.	.50
18th	94.	74.	.36
19th	97.	74.	.30
20th	92.	74.	.39
21st	89.	78.	.59
22d	93.	78.	.49
26th	93.	76.	.43
27th	90.	76.	.50
28th	92.	76.	.45
29th	96.	76.	.37
30th	96.	77.	.39

KNOXVILLE, TENN.—Prof. O. W. Morris.

	Air.	Evap'n.	Humidity.
5th	89.9	73.2	.41
6th	88.1	71.2	.40
12th	96.	69.	.38
13th	86.2	66.	.30
14th	88.8	68.9	.32
15th	90.1	70.5	.34
16th	87.	70.1	.40
28th	91.	72.3	.37
29th	93.	71.9	.26
30th	94.4	74.3	.35

LEBANON, TENN.—Prof. A. P. Stewart.

5th	87.8	70.5	.39
6th	86.9	70.7	.41
12th	89.7	—	—
13th	89.9	—	—
14th	91.	—	—
15th	91.4	—	—
16th	89.9	—	—
28th	92.6	71.6	.32
29th	93.2	75.2	.40
30th	95.9	73.6	.31

CLARKSVILLE, TENN.—W. M. Stewart.

4th	86.7	76.4	.59
5th	88 1	71.2	.41
6th	88.7	72.5	.42
11th	84.9	73.4	.56
12th	87.4	68.	.33
13th	87.4	69.8	.38
14th	87.4	70.1	.39
19th	87.2	68.	.33
20th	90.1	74.1	.44
27th	90.1	72 5	.39
28th	91.	70.5	.32
29th	92.5	74.8	.41
30th	92.8	74.5	.40

OBERLIN, O.—Prof. J. H. Fairchild.

13th	90.	77.	.53
14th	89.	78.	.59
15th	93.	83.	.64
16th	91.	80.	.60
17th	97.	68.	.61
18th	82.	72.	.59
19th	90.	82.	.70
20th	92.	81.	.61
21st	95.	82.	.55

HILLSBOROUGH, O.—J. Mc. D. Matthews.

13th	85.5	73.	.53
14th	88.5	70.	.36
15th	80.5	78.	.89
16th	87.5	73.	.47
17th	79.5	67.	.49
18th	81.	64.	.35
19th	87.	71.	.43
20th	89.5	72.	.39
21st	90.	74.	.44
28th	87.5	72.	.44
29th	91.5	76.	.46
30th	93.	74.	.37

BROOKLYN, MICH.—Dr. M. K Taylor.

13th	88.	73.	.46
14th	90.	74.	.44
15th	94.	82.	.58
16th	72.	70.	.90

BROOKLYN, MICH. (Continued.)

	Air.	Evap'n.	Humidity.
17th	—	—	—
18th	81.	71.	.49
19th	88.	80.	.69
20th	90.	81.	.66
21st	97.	83.	.53
22d	92.	82.	.70
28th	90.	82.	.70
29th	79.	73.	.74
30th	81.	72.	.63

N. HARMONY, IND.—John Chappellsmith.

10th	90.	—	.37
11th	91.	—	.37
12th	90.	—	.41
13th	92.	—	.39
14th	93.	—	.37
15th	92.5	—	.44
16th	89.	—	.54
17th	86.	—	.34
18th	86.	—	.52
19th	92.	—	.39
20th	95.	—	.60
21st	91.	—	.60
22d	94.	—	.52
23d	76.	—	.56
24th	78.	—	.44
25th	81.	—	.38
26th	89.5	—	.34
27th	93.	—	.46
28th	97.5	—	.38
29th	95.	—	.50
30th	92.	—	.46

ALTON, ILL.—Dr. John James.

10th	82.	80.	.92
11th	83.	76.	.71
12th	85.	80.	.79
13th	83.	76.	.71
14th	85.	77.	.68
15th	78.	78.	1.00
16th	80.	74.	.73
17th	79.	73.	.74
18th	81.	75.	.75
19th	86.	84.	.92
20th	86.	80.	.77
21st	86.	80.	.77
28th	92.	82.	.64
29th	82.	76.	.74
30th	85.	78.	.72

POULTNEY, IOWA.—Dr. Benj. F. Odell.

10th	92.	78.	.51
11th	87.	75.	.55
12th	92.	77.	.48
13th	96.	81.	.50
14th	93.	78.	.44
15th	88.	74.	.49
16th	80.	69.	.55
17th	79.	70.	.62
18th	90.	78.	.56
19th	94.	81.	.55
20th	97.	81.	.48
21st	96.	80.	.47
29th	81.	72.	.63
30th	84.	71.	.50

BELLE FONTAINE, WIS.—Thomas Gay.

12th	91.	76.	.48
13th	90.	77.	.53
14th	91.	82.	.67

BELLE FONTAINE, WIS. (Continued.)

	Air.	Evap'n.	Humidity.
15th	88.	76.	.55
16th	74.	70.	.81
17th	79.	69.	.58
18th	89.	79.	.62
19th	85.	76.	.64
20th	87.	71.	.73
21st	92.	78.	.51
29th	79.	69.	.58
30th	80.	68.	.52

AUGUST, 1853.

ST. MARTINS, MONT'L.—DR. C. SMALLWOOD.

10th	92.4	74.4	.46
11th	95.4	77.1	.44
12th	80.1	76.5	.82
13th	86 3	76.3	.61
14th	81.	72.1	.64
15th	88.6	74.	.42
16th	89.	76.	.53

BURLINGTON, VT.—PROF.. Z. THOMPSON.

10th	86.	74.	.55
11th	92.	77.	.48
12th	91.	79.	.57
13th	91.	80.	.60
14th	74.	69.	.76
15th	85.	72.	.51

AMHERST, MASS.—PROF. E. S. SNELL.

10th	85.2	74.1	.57
11th	88.7	80.6	.69
12th	91.9	75.9	.45
13th			
14th	91.5	82.	.65
15th	76.6	69.8	.69

PITTSFIELD, MASS.—T. H. BENJAMIN.

10th	82.4	73.4	.63
11th	84.2	71.6	.52
12th	86.9	79.5	.78
13th	86.	75.5	.60
14th	87.	84.2	.88
15th	79.	68.7	.55

WORCESTER, MASS.—DR. E. A. SMITH.

10th	84.5	73.4	.57
11th	88.5	73.7	.47
12th	90.6	75.2	.46
13th	91.4	76.2	.47
14th	89.6	75.2	.49
15th	71.6	63.1	.61

NEWBURYPORT, MASS.—DR. H. C. PERKINS.

10th	75.2	70.3	.77
11th	90.3	75.2	.47
12th	92.8	77.7	.47
13th	70.5	67.4	.83
14th	90.8	79.7	.59
15th	68.	62.4	.70

POMFRET, CT.—DANIEL HUNT.

10th	81.	75.	.74
11th	85.	77.	.68
12th	88.	77.	.58
13th	89.	82.	.73
14th	84.	80.	.83
15th	71.	67.	.80

BLOOMFIELD, N. J.—R. L. COOKE.

9th	90.	78.	.56
10th	86.5	72.5	.49
11th	86.	81.	.79
12th	95.	81.	.52
13th	98.	83.	.51
14th	91.	82.5	.69

NORRISTOWN, PA.—REV. J. GRIER RALSTON.

10th	84.	76.	.68
11th	89.	77.	.56
12th	90.5	77.	.52
13th	89.	81.	.70
14th			
15th	82 5	76.	.73

PHILADELPHIA, PA—PR. J. A. KIRKPATRICK

10th	91.	77	.51
11th	93.	80.	.55
12th	93.5	81.	.58
13th	92.	81.	.61
14th	92.5	81.	.61
15th	86.	78.	.68

LIMA, PA.—JOSEPH EDWARDS.

10th	86.3	77.	.64
11th	88.1	77.9	.60
12th	88.7	80.9	.67
13th	87.	80.6	.74
14th	87.2	80.6	.73
15th	82.4	77.	.77

HOLLIDAYSBURG, PA.—J. R. LOWRIE.

10th	86.1	72.6	.50
11th	87.2	72.8	.48
12th	89.6	73.9	.45
13th	90 3	75.3	.47
14th	88.7	77.1	.57
15th	87.8	75.3	.54

BALTIMORE, MD.—DR. L. H. STEINER.

10th	92 6	72.5	.34
11th	92.6	79.7	.54
12th	93.9	77.	.44
13th	94.1	78.8	.49
14th	94.1	79.7	.51
15th	89.6	77.9	.57

SMITHSONIAN INSTITUTION.

9th	88.5	—	—
10th	90.5	—	—
11th	91.5	—	—
12th	92.	—	—
13th	92.	—	—
14th	94.	—	—
15th	91.	—	—

ALEXANDRIA, VA.—Benj. Hallowell.

	Air.	Evap'n.	Humidity.
10th	85.1	75.2	.62
11th	87.8	75.2	.53
12th	87.8	77.	.59
13th	88.7	77.9	.59
14th	89.6	77.9	.57
15th	92.3	77.9	.50

CAMDEN, S. C.—Thornton Carpenter.

9th	89.6	75.9	.51
10th	90.6	73.	.40
11th	87.5	71.	.40
12th	89.3	72.8	.41
13th	90.2	72.	.37
14th	—	—	—
15th	93.2	77.1	.45

SAVANNAH, GA.—Dr. John F. Posey.

9th	84.7	79.3	.78
10th	89.6	79.7	.62
11th	82.7	77.	.76
12th	85 2	76.8	.65
13th	82.4	77.9	.80
14th	78.9	76.8	.90
15th	77.	74.8	.88
16th	83.1	78.8	.82

JACKSONVILLE, FLA.—Dr. A. S. Baldwin.

10th	87.	80.	.72
11th	86.	79.	.72
12th	87.	80.	.72
13th	87.5	80.	.705
14th	89.	83.	.76
15th	87.	79.	.69

CULLODEN, GA.—Prof. John Darby.

10th	86.	75.2	.59
11th	85.1	72.5	.52
12th	85.2	76.1	.63
13th	84.2	71.6	.52
14th	85.2	73 7	.56
15th	82.4	77.	.77

EUTAW, ALA.—A. Winchell.

10th	91.	82.	.67
11th	93.	84.	.67
12th	91.	80.	.60

EUTAW, ALA. (Continued.)

	Air.	Evap'n.	Humidity.
13th	88.	79.	.65
14th	89.	78.	.59
15th	91.	83.	.70

AUSTIN, TEXAS.—Dr. Sam'l K. Jennings.

6th	96.	78.	.42
7th	96.	77.	.40
8th	94.	75.	.38
9th	88.	76.	.55
10th	86.	76.	.61
11th	85.	76.	.64
12th	76.	76.	1.
13th	88.	76.	.55
14th	88.	74.	.49
15th	82.	76.	.74
16th	95.	76.	.38
17th	99.	76.	.31
18th	98.	78.	.38
25th	90.	76.	.50
26th	92.	78.	.51
27th	92.	78.	.51
28th	90.	76.	.50
29th	88.	74.	.49

HILLSBOROUGH, O.—J. McD. Matthews.

10th	88.	71.	.40
11th	90.	71.	.35
12th	89.5	77.	.54
13th	85.	77.	.68
14th	78.	74.	.82
15th	81.	74.	.70
16th	86.	74.	.55

OBERLIN, O.—Prof. J. H. Fairchild.

10th	74.	70.	.81
11th	76.	65.	.52
12th	70.	60.	.52
13th	77.	64.	.46
14th	81.	68.	.48
15th	86.	77.	.65

POULTNEY, IOWA.—Dr. Benj. T. Odell.

9th	95.	82.	.55
10th	97.	84.	.56
11th	94.	80.	.52
12th	92.	80.	.58
13th	83.	75.	.68
14th	86.	—	—
15th	84.	76.	.68

JUNE, 1853.

SMITHSONIAN INSTITUTION.

20th	92.5	80.5	.57
21st	92.	81.5	.63
22nd	92.5	79.	.53
23rd	92.	81.	.60
24th	77.	64.5	.47
25th	75.5	67.	.62
27th	88.5	79.	.64
28th	92.5	77.	.47
29th	94.	79.5	.51
30th	98.5	82.5	.49

The observations of the Wet-bulb at the Smithsonian Institution, in the early part of August, were unfortunately defective from the absence of the regular observer.

At New-Harmony, Indiana, the reductions were made without transmitting the observations of the temperature of evaporation.

MEAN TEMPERATURE AND PRECIPITATION MONTHLY FOR THE SUMMER OF 1853, AT VARIOUS STATIONS IN THE UNITED STATES AND CANADA.

	STATIONS.	MEAN TEMPERATURE.			AMOUNT OF RAIN.		
		June.	July.	Aug	June.	July.	Aug.
N. S.	Albion Mines	61.6	69.1	65.0	3.105	2.948	4.120
Me.	Bucksport	66.0	72.0	....	0.050	3.400	.....
"	Biddeford	69.4	73.6	70.2	0.648	1.892	3.336
"	Fryeburg	....	....	....	0.830	1.580	3.125
N. H.	Londonderry	67.0	70.0	68.4	1.250	2.980	6.800
"	Manchester	69.5	72.5	69.2	1.061	1.986	9.154
"	Concord	69.3	71.5	68.6	1.375	4.080	4.875
Vt.	St. Johnsbury	65.0	65.9	....	1.810	3.140	.....
"	Burlington	69.2	70.5	69.8	1.740	3.120	3.460
C. E.	Montreal	68.7	68.0	69.1	3.131	3.102	7.089
Mass.	Amherst	67.0	68.4	69.3	2.636	3.585	6.126
"	Worcester	68.6	71.7	68.7	1.010	3.290	10.710
"	Richmond	....	....	....	2.375	4.000	10.225
"	Newburyport	67.0	71.5	67.2	0.656	1.754	6.959
"	N. Attleboro	67.4	....	....	1.840	2.022	4.250
"	Barnstable	66.7	71.0	71.0	2.075	3.510	2.460
Con.	Pomfret	66.1	68.6	68.7	1.440	3.850	6.850
"	Salisbury	....	....	65.1	.....	.....	3.666
"	New London	66.7	70.4	72.1	.....	.....	.....
N. Y.	Fort Hamilton	69.0	73.5	74.2	4.420	5.830	5.500
"	Fort Columbus	71.2	72.7	73.5	4.800	4.400	5.230
"	West Point	69.1	70.8	71.4	3.770	10.480	7.800
N. J.	Bloomfield	69.9	71.3	71.8	2.750	3.652	12.117
N. Y.	Madrid	....	68.5	....	0.990	1.790	.....
"	Houseville	....	....	70.4	.....	2.470	2.130
"	Constableville	....	69.2	....	2.875	3.625	.....
"	Gouverneur	69.8	70.7	....	1.650	0.800	.....
"	Lodi	69.5	69.5	70.0	2.250	0.750	4.750
"	Buffalo	68.2	....	70.1	1,000	.....	2.150
Pa.	Moss Grove	71.5	68.8	68.5	2.500	0.700	3.100
"	Pittsburg	74.0	72.0	71.0	1.853	3.428	7.747
"	Bedford	72.5	73.3	72.6	0.328	1.513	2.364
"	Hollidaysburg	72.5	73.4	69.7	1.043	1.188	5.041
"	Gettysburg	74.9	74.7	73.0	0.266	5.672	3.382
"	Norristown	73.2	73.2	73.1	1.500	4.841	5.020
"	Harrisburg	....	79.6	78.1	0.592	3.687	2.853
"	Morrisville	70.3	71.9	71.6	3.200	7.000	4.600
"	Philadelphia	75.3	76.6	75.7	1.050	6.290	3.080
"	Lima	71.5	72.9	71.2	1.065	6.890	2.960
Md.	Baltimore	77.7	78.5	77.9	0.150	2.491	4.725
"	Frederick	77.2	77.2	75.3	0.389	4.141	4.059
"	Schellman Hall	74.0	74.2	77.2	.....	2.625	6.625
"	Washington	75.0	....	77.5	2.353	5.346	4.555
Va.	Alexandria	76.0	76.4	76.0	2.872	5.108	5.992
"	Buffalo	77.0	75.1	75.7	0.638	3.899	2.733
"	Lewisburg	74.0	75.0	75.5	2.300	4.400	2.450
"	Bruns. Co.	....	....	....	2.600	5.800	4.000
"	Portsmouth	79.6	....	....	0.390	.....	.....
S. C.	Camden	79.3	80.3	78.6	3.312	7.163	5.763
Ga.	Savannah	79.0	81.5	79.4	0.787	6.464	8.168
"	Whitemarsh, Id.	....	80.9	78.6	1.280	5.280	5.580
"	Sparta	81.6	82.8	....	0.710	5.350	.....
"	Culloden	81.7	81.6	80.4	0.370	9.810	1.180

MEAN TEMPERATURE AND PRECIPITATION MONTHLY. (*Continued.*)

STATIONS.		MEAN TEMPERATURE.			AMOUNT OF RAIN.		
		June.	July.	Aug.	June.	July.	Aug.
Ga.	Penfield	.....	77.8	76.7	0.228	3.720	1.900
Fla.	Jacksonville	78.9	81.7	82.5	3.240	7.400	2.700
"	Knox Hill	78.7	79.9	79.9	3.454	7.519	.....
"	Cedar Keys	80.1	83.2	81.9	3.262	11.475	3.625
"	Talahassee	80.6	80.0	81.0	2.820	7.920	4.670
"	Pensacola	80.0	82.1	82.4	1.262	2.512	1.566
Ala.	Eutaw	83.7	81.4	81.2	0.780	8.933	5.806
Tex.	Austin	80.8	82.0	81.0	.....	.....	.....
Tenn.	Knoxville	75.3	.....	.....	1.409	.....	.....
"	Glenwood	76.4	75.4	74.5	0.900	3.671	4.525
"	Lebanon	79.5	77.7	.....	1.052	4.987	.....
Ky.	Danville	79.3	.....	76.5	0.360	.....	3.485
"	Millersburg	78.1	75.6	74.9	.....	.....	.....
Ohio.	Cincinnati	.....	75.6	.....	.....	4.810	.....
"	Marietta	75.0	73.1	.....	0.650	3.706	1.340
"	Mount Vernon	78.9	.....	.....	2.350	.....	.....
"	Granville	74.3	.....	72.6	1.300	.....	4.060
"	Zanesville	76.0	76.8	75.7	.....	2.173	.....
"	Cleveland	68.5	.....	.....	3.417	.....	.....
"	Oberlin	75.5	70.8	73.4	2.110	3.790	4.760
Mich.	Detroit	76.5	75.0	.....	2.567	2.333	.....
"	Ann Arbor	71.4	69.6	72.2	0.710	1.100	3.960
"	Brooklyn	73.6	71.2	.....	1.500	1.710	.....
"	Battle Creek	74.3	71.5	73.5	1.600	1.560	1.000
Va.	Richmond	.....	73.5	.....	1.220	3.045	5.585
Ill.	Athens	75.4	73.3	73.9	5.520	3.870	3.650
"	Alton	75.7	74.3	74.9	.....	3.102	2.304
Ia.	Fort Madison	76.7	75.9	76.0	7.650	3.800	5.050
"	Muscatine	.....	68.6	70.9	6.400	6.600	1.700
"	Poulteney	70.5	68.8	68.6	3.304	6.325	0.520
"	Bowen's Prairie	72.3	68.7	70.5	.....	6.600	0.760
Wis.	Platteville	74.4	72.3	74.9	3.625	7.750	1.125
"	Janesville	73.2	69.1	.....	2.620	4.630	.....
"	Beloit	73.1	68.7	71.4	4.950	8.100	.....
Minn.	Lac-qui-parle	65.8	68.9	70.6	.....	6.750	.....
Ind.	New Harmony	79.3	77.7	.....	1.230	2.430	.....
Wis.	Madison	70.1	67.8	70.3	.....	.....	.....
"	Emerald Grove	70.7	69.0	71.9	.....	.....	.....
"	Bellefontaine	71.4	70.0	71.3	.....	.....	.....

NOTE.—The following note of observations at the greatest extreme of heat for the summer, at Washington, made and published at the time, may be sufficiently interesting to observers generally, to warrant appending it to this paper:

It may interest some of the readers of the Intelligencer, to see the record of temperatures observed on Thursday and Friday last, at the Magnetic and Meteorological Observatory of the Smithsonian Institution. It will be seen that the highest point was reached on Thursday—higher than was

before supposed possible in a free current of air in these latitudes.

Thursday, June 30.				Friday, July 1.			
	Air.	Evaporation.	Humidity.		Air.	Evaporation.	Humidity.
9 A. M.	84°	79°	.79	9 A. M.	85°	79°.5	.78
10 "	88°	80°	.68	10 "	88°	80°	.70
11 "	90°	80°.5	.65	11 "	89°.5	80°.5	.66
12 M.	94°	81°	.55	12 M.	91°.5	80°	.59
1 P. M.	96°	82°.5	.56	1 P. M.	94°	80°.5	.54
2 "	98°.5	82°.5	.48	2 "	95°	79°	.47
2½ "	99°	81°	.43	3 "	93°	78°	.48 cl'dy
3 "	99°.25	81°	.43				
3½ "	98°	79°.5	.41 cl'dy				
5 "	86°	71°.5	.47				

In the sun, and over a non-reflecting surface of fresh vegetation, the naked bulb thermometer kept pace with that in the Observatory after 10 o'clock Thursday. Over the ordinary earth surface it rose to 106° in the sun. In the shade of a tree of moderate size, and open to the general reflection from the surface, the mercury rose to 103°. On a background of black wool, or enveloped in black wool and full in the sun's rays, it rose to 107°.

The whole mass of air at the surface was so intensely heated that the temperature of open grounds was much greater than that of shaded places in the city with less circulation of air. Such temperatures are impossible except in a very dry atmosphere and after long-continued drought. They are unknown on the Gulf coast even, the maximum at Key West being 90° and at Mobile 94°, from several years of hourly observations at United States coast survey stations. The interior of Texas and other arid districts towards the Pacific give the highest air temperatures, often of 110° to 115° for days together at the mid-day hours.

At 3 o'clock of Thursday the thermometer fell more than two degrees on clasping the bulb with both hands firmly, and

rose again on removing them. This was tried with several thermometers, and though very clear of solution, as the blood is 98°*, or three degrees lower than the air at that time, it was a novel and somewhat exciting experiment. Dr. Franklin was the first, in 1750, to remark an atmospheric temperature above that of the blood, and to notice the power of the human body to retain its temperature while all inanimate substances grew steadily warmer. President Madison† of William and Mary College, Virginia, in 1779, gives the following curious remark and quotation:

"I do not recollect ever to have seen the thermometer here at more than 95, though Dr. Franklin mentions that in June, 1750, it stoop at 100 in the shade at Philadelphia, when, he observes—

"'I expected that the natural heat of the body (96) added to the heat of the air (100) should jointly have created or produced a much greater degree of heat in the body; but the fact was that my body never grew so hot as the air that surrounded it, or the inanimate bodies immersed in the same; for I remember well that the desk, when I laid my arm on it, the chair when I sat down in it, all felt exceedingly warm to me, as if they had been warmed before the fire. And I suppose a dead body would have acquired the temperature of the air, though a living one, by continual sweating, and by the evaporation of that sweat, was kept cold.'

"I have been more particular in transcribing this passage from the works of this philosopher, as it certainly shows to whom the merit of certain late discoveries, which have made so much noise in the philosophical world, most justly belongs. I mean that power which the human as well as all animate bodies have of counteracting the heat of an atmosphere in which they are placed. For what do all the experiments upon heated rooms evince further than had before been published by the Doctor? It is thus that Franklin, sitting in his chair, like Newton reasoning on the figure of the earth, could show what must cost others infinite labor and fatigue."

We hope the instances may be rare in which the air and the earth alike fail us, and our persons remain the only refrigerating bodies on which we may rely to keep cool.

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* 98°. The flesh surface is but 96°.

† In a letter to Dr. Rittenhouse, of Philada., Trans. Amer. Phil. Soc., vol. II. 1786.


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